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Increasing use Efficiency of Zinc Fertilizers by Brinjal through Rescheduling the Time and Method of Application

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Abstract—*Micronutrients are becoming deficient day by day due to follow of intensive cultivation with high analysis fertilizers. Brinjal is one of the widely grown vegetable crops with high nutritive value responsive to applied zinc in Zn deficient soils. We assessed Zn use efficiency (ZnUE) by brinjal upon different modes of Zn fertilization viz., soil application at lower dose (5.0 kg Zn ha^{-1}), soil application at higher dose (10.0 kg Zn ha^{-1}) and soil plus foliar mode of fertilization (5.0 kg Zn ha^{-1} as basal + Foliar spray of Zn twice @ 0.5% $ZnSO_4.7H_2O$ solution) along with the application of farm yard manure (@5 t ha^{-1}). As Zn fertilizers are costly inputs, and moreover, micronutrient use efficiency by crops are hardly more than 5%; if we enhance its use efficiency by lowering the amounts of Zn application, then farmers could afford this costly input to maintain crop productivity as well as enrich this nutritionally important element in edible plant parts. Results showed that Zn use efficiency of brinjal varied between 2.19 to 4.74% upon different modes of Zn fertilizer application. Split application i.e. soil plus foliar application of Zn fertilizers increased the ZnUE by brinjal to the tune of 2.5-fold than only basal mode of application at higher doses. Application of FYM showed beneficial effect over no FYM application in enhancing its use efficiency. Organics could influences Zn solubility in soil and thus triggers Zn nutrition of crops as well as Zn use efficiency. Benefit Cost ratio calculations showed that upon application of Zn containing fertilizers benefit: cost (B:C) ratio increased to the tune of 13.8% over the control. Thus, a protocol for fertilization of this nutritionally important micronutrient along with farm yard manure was developed for this widely grown vegetable in this Zn deficient areas.*

Keywords*: Brinjal, Zinc, farm yard manure, Zinc use efficiency, Benefit cost ratio.*

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